

windings of the wire coil.

29. The process in accordance with claim 29, wherein:

said inserting of the chip unit into said recess is performed after said guiding and said fixing.

30. The process in accordance with claim 29, wherein:

said recess extends through said substrate;  
said fixing of the wire conductor is on one side of the substrate and said inserting of the chip unit is from another opposite side of the substrate.

31. The process in accordance with claim 29, wherein:

said recess extends through said substrate;  
said fixing of the wire conductor is on one side of the substrate and said inserting of the chip unit is from another opposite side of the substrate.

#### REMARKS

The claims have been amended to address the Examiner's rejections, to place the application in better form, and to further highlight and more clearly point out the important features of the invention. Applicant recognizes the Examiner's indication that claims 44, 45, 48, 50, 52 and 54 - 61 include allowable subject matter, and that claim 78 is held to be

allowable. Applicant thanks the Examiner for indicating allowable subject matter.

Claim 40 has been rejected as being obvious over WO 96/07984 by Mundigl. Applicant notes that this reference corresponds to U.S. Patent 5,809,633. During these remarks, Applicant will make reference to portions of the U.S. Patent 5,809,633 instead of '984, since the '633 reference is in the English language.

Claim 40, and new claim 79, set forth a specific order for the process of the present invention. Claim 40 sets forth that the process is divided into two phases, with a first phase and a second phase. The second phase is performed after the first phase and it is Applicant's position that this is understood by the setting forth of first and second phases.

In the first phase, as set forth in amended claim 40, the wire conductor is guided over and away from the terminal area. Also in the first phase, the wire conductor is fixed to the substrate. In the subsequent second phase, the wire conductor is connected to the terminal area. Therefore in the present invention, first the wire is guided and fixed to the substrate, and secondly the wire conductor is connected to the terminal area.

Claims 40 and 79 set forth that the wire conductor is guided over the recess on the substrate and is also guided away from the recess. Claim 79 further sets forth that subsequent to this step, the wire conductor is connected to the substrate to form the wire coil. Claim 79 still further sets forth that subsequent to the fixing step, the step of connecting the wire conductor to the terminal area is performed. Both claims 40 and 79 therefore clearly set forth a specific order in which the steps of the process occur.

Applicant has reviewed the Mundigl reference and notes that the specific order of the

steps in claims 40 and 79 is not taught nor suggested in Mundigl. The '633 reference states in column 2 lines 46 - 51 that the wire has initially been bonded to one of the contact zones 4, then wound in a plurality of turns to form the coil and finally bonded onto the other contact zone. The semi-conductor chip 3 and the coil 5 is further described as being subsequently inserted into the recess 2 and the carrier body 1. Column 2 lines 56 and 57 set forth that the smart card is completed through the use of corresponding coverings on the carrier body. Mundigl, therefore teaches away from the specific order of the process steps of claim 40 and 79. Furthermore, Applicant finds no incentive in the applied prior art which would lead a person away from the specific order of Mundigl, and towards the specific order of claims 40 and 79. Claims 40 and 79 therefore cannot be obvious in view of Mundigl.

The specific order of the present invention is very beneficial, especially when a large number of turns in the coil are needed, when a very fine wire is used as the wire conductor, and/or the wires need to be placed very close to each other in the wire coil. The wire conductor can be laid down very accurately in the present invention since it is fixed in position as it is being guided on the substrate. In Mundigl, the coil is disposed on the carrier body after the coil has been formed, and after the coil has been connected to the chip. Applicant has found this process of Mundigl to be very difficult, especially with regard to many turns, fine wires or close spacing of the wire coil. The present invention overcomes these problems and is therefore an improvement over Mundigl. Applicant respectfully requests patent protection for this improvement.

Claim 79, and claims 41 - 43 further set forth the feature of ultrasonically vibrating the

wire guiding device and the wire conductor for the fixing of the wire conductor to the substrate.

Applicant notes that this feature is not taught nor suggested in Mundigl. In fact Mundigl teaches away from this feature by indicating that the smart card is completed merely through the use of corresponding coverings on the carrier body. The rejection holds that the use of an ultrasonic means to bond the wire onto the substrate is a mere matter of design choice.

Applicant traverses this holding.

The step of ultrasonically vibrating the wire and/or the wire guiding device, provides a very efficient way of both forming the coil and attaching the coil at the same time. This is especially true when many turns, fine wires or close spacing is required. When forming a wire into a coil, great care must be taken to accurately position the turns or windings of the coil with respect to each other. This is especially true when uninsulated wire conductors are used, since electrical contact between adjacent coils can defeat the purpose of the turns or winding of the coil. When many turns, fine wire or close spacing is required, it can be difficult to position the individual turns with respect to each other. By the present invention setting forth fixing the wire to the substrate during the forming of the wire coil, this problem is eliminated.

Applicant has found that ultrasonic vibrating of the wire and wire guiding device, can efficiently combine both the guiding and the fixing steps. This combination has been found to be economical to manufacture and reliable in operation. Therefore the use of an ultrasonic means is not a mere matter of design choice, but instead provides benefits which are not taught nor suggested in the prior art. The use of an ultrasonic means is therefore not obvious to a person of ordinary skill in the art, especially in combination with Mundigl, which does not form

a wire coil and fix the wire coil to a substrate at the same time. The present specification on page 3 lines 31 - page 4 line 9 indicates that the superposition of the wiring movement together with the transverse movement, which has been previously set forth as being induced by the action of ultrasound, enables continuous operation of the wiring device without the actual wiring movement having to be interrupted. This portion of the specification further states that the movement induced by the ultrasound proves to be particularly effective during the partial counter sinking or the close contacting of the cross section of the wire. Therefore the application provides purpose for the ultrasonic vibration and the ultrasonic vibration is not a mere matter of design choice.

If the Examiner has any comments or suggestions which would further favorable prosecution of this application, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

Applicant thanks the Examiner for indicating that the Foreign Priority Document DE 196 04 840 may precede the teachings used for the prior art rejection in the last Office Action. Applicant is presently in the process of obtaining an English translation of this document and will forward such to the Examiner once it is available.

At this time Applicant respectfully requests reconsideration of this application, and based on the above amendments and remarks, respectfully solicits allowance of this application.

Respectfully submitted  
for Applicant,

By: 

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DATED: June 6, 2000  
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